

In the Claims:

1. (currently amended) A method of forming a plate for the passage through [[a]] at least two vertical passages ~~set of apertures~~ of at least one substance from a first location to a second location comprising the steps of:

providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass;

forming at least two sets of vertical passages ~~apertures~~ arranged in a array of sample cells in a first layer, said at least two vertical passages passing completely through said first layer, with each sample cell containing a member of each of said at least two sets of vertical passages ~~apertures~~;

forming corresponding ~~sets of vertical passages~~ apertures connecting to said at least two sets vertical passages in at least one corresponding layer, said corresponding vertical passages passing completely through said corresponding layer;

forming a plurality of set of ~~connecting horizontal channels~~ extending in a horizontal direction ~~apertures~~ in a lower layer disposed below said first and said at least one corresponding layer, in which at least some of said plurality of

horizontal channels ~~apertures~~ in said lower layer connect members of said at least two sets of vertical passages ~~apertures~~; and

sintering ~~assembling~~ said first layer, said at least one corresponding layer and said bottom layer to form a plate containing an array of sample cells containing horizontal and vertical interconnect U-shaped ~~structures~~.

2. (currently amended) A method according to claim 1, in which said lower layer is disposed above a solid layer forming a bottom surface of said horizontal and vertical interconnect U-shaped ~~structure~~.
3. (currently amended) A method according to claim 1, in which said lower layer contains said horizontal channels ~~aperture~~ and also forms a bottom surface of said horizontal and vertical interconnect U-shaped ~~structure~~.
4. (canceled) A method according to claim 1 further comprising a step of: bonding said at least two of said layers together, thereby forming said plate.
5. (canceled) A method according to claim 4, in which said step of bonding said at least two of said layers together, is effected by sintering.
6. (currently amended) A method according to claim 1, in which: said steps of forming horizontal channels and vertical passages ~~apertures~~ in said

at least one of said first, second and third layers are effected by a material removal technique.

7. (currently amended) A method according to claim 1, in which:
said steps of forming horizontal channels and vertical passages apertures in said at least one of said first, second and third layers are effected by a non-material removal technique.

8. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is a removable layer having an upper surface adapted for holding sample materials.

9. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is adapted for passing light.

10. (currently amended) A method according to claim 1, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is transparent.

11. (currently amended) A method according to claim 9, in which said removable layer has a thickness less than 1.0 mm ~~is adapted for high speed scanning.~~

12. (currently amended) A method according to claim 1, in which at least one of said ~~sets of vertical~~ passages apertures contains removable liners, whereby ~~material adhering to said removable liners may be processed away from said plate.~~

13. (currently amended) A method according to claim 12, in which at least one of said removable liners is selected from a group of materials which is a carrier for a reagent, ~~whereby in operation said reagent reacts with a component of an applied fluid.~~

14. (currently amended) A method according to claim 12, in which at least one of said ~~sets of vertical~~ passages apertures is connected to a space for storing rinsing fluid.

15. (currently amended) A method according to claim 12, in which a material adhering to an inner surface of one of said ~~sets of apertures~~ passages or channels is a carrier for a reagent, whereby in operation said reagent reacts with a substance in an applied fluid.

16. (currently amended) A method according to claim 1, in which said vertical passages apertures and a reaction region of structures of passages apertures are adapted such that bubbles rise to a region outside said reaction region.

17. (currently amended) A method according to claim 1, in which a first one of said ~~sets of vertical passages apertures~~ contains a surface material having a first attraction for capillary action and a second one of said ~~sets of vertical passages apertures~~ contains a surface material having a second attraction for capillary action, whereby different fluids may be selectively inserted into said first and second ~~sets of vertical passages apertures~~.

18. (currently amended) A sample-holding plate containing an array of sample cells for the reaction of reagents in at least two vertical passages ~~a set of apertures~~ comprising:

a plurality of ceramic layers sintered together, said ceramic layers comprised of a material selected from the group consisting of alumina, glass ceramic, aluminum nitride, borosilicate glass and glass;

at least two sets of vertical passages ~~apertures~~ arranged in said array of sample cells in a first layer, with each sample cell containing a member of each of said at least two sets of vertical passages ~~apertures~~;

at least one corresponding layer containing sets of corresponding vertical ~~passages apertures~~ connecting to said at least two sets of vertical passages ~~apertures~~ in first layer;

a bottom layer disposed below said first and said at least one corresponding layer and containing a plurality set of connecting horizontal channels apertures, in which said ~~set of~~ connecting horizontal channels apertures connect at least some members of said at least two sets of vertical passages apertures, thereby forming an array of sample cells containing horizontal and vertical interconnect U-shaped structures.

19. (currently amended) A sample-holding plate according to claim 18 further comprising a first reagent and a second reagent, in which a first one of said vertical passages apertures comprises a restricted portion capillary retention valve adapted for storing a quantity of [[a]] said first reagent; and a second one of said vertical passages apertures is adapted for receiving [[a]] said second reagent and bringing said second reagent in contact with said first reagent.

20. (original) A sample-holding plate according to claim 19, in which said first and second reagents have quantities such that said first and second reagent overlap by a diffusion length of one of said first and second reagents.

21. (currently amended) A sample-holding plate method according to claim 19, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is a removable layer having an upper surface adapted for holding sample materials.

22. (currently amended) A sample-holding plate ~~method~~ according to claim 18, in which the layer that forms the bottom surface of the horizontal and vertical interconnect U-shaped structure is transparent.

23. (currently amended) A sample-holding plate ~~method~~ according to claim 18, in which at least one of said ~~sets of~~ vertical passages ~~apertures~~ is connected to a space for storing rinsing fluid.

24. – 31. (canceled)